



Differential effects of direct and cross examination on mock jurors' perceptions and memory in cases of child sexual abuse

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When children testify in cases of child sexual abuse (CSA), they often provide minimal responses to attorneys' questions. Thus, how attorneys ask questions may be particularly influential in shaping jurors' perceptions and memory for case details. This study examined mock jurors' perceptions after reading an excerpt of a CSA trial transcript. Participants' memory of the excerpt was tested after a two-day delay. We examined how reading a direct or cross-examination excerpt that included either high or low temporal structure impacted participants' perceptions, verdict decisions and memory reports. We found that participants who read a direct examination excerpt rated the child witness as more credible, were more likely to convict the defendant and had more accurate memory reports than those who read a cross-examination excerpt, regardless of temporal structure. Suggestions for improving jurors' comprehension and recall of child statements presented as evidence in CSA cases are discussed.

Key words: Attorney questioning; child sexual abuse; child witness; juror decisions; memory; temporal structure.

Researchers have extensively examined children's strengths and vulnerabilities during legal questioning (e.g. Ceci & Bruck, 1995; Klemfuss & Ceci, 2012; Klemfuss, Cleveland, Quas, & Lyon, 2016; Klemfuss & Olaguez, 2018; Lamb, Hershkowitz, Orbach, & Esplin, 2008; Lamb, Malloy, Hershkowitz, & La Rooy, 2015; Saywitz, Lyon, & Goodman, 2017). The findings have been especially important for increasing children's accuracy, which is paramount in child sexual abuse (CSA) cases, given that the child's allegation that the abuse occurred may be the only piece of evidence available to jurors. However, when it comes to legal decisions in CSA cases, jurors must make decisions based on their perceptions of child witness credibility, rather than their actual accuracy, given that ground

truth is not known. As such, it is critical to understand the factors and processes that influence jurors' perceptions of the child witness's credibility, including after a delay, given that jurors must typically rely on their memory of evidence to make their final decisions.

Much of the research in the child witness credibility domain has focused on child factors, such as gender (Bottoms, Golding, Stevenson, Wiley, & Yozwiak, 2007), emotionality (Cooper, Quas, & Cleveland, 2014) and confidence (Cleveland & Quas, 2016). However, a small but growing body of research has begun to examine how attorney questioning influences children's responses in court (Andrews, Ahern, Stolzenberg, & Lyon, 2016; Andrews, Lamb, & Lyon, 2015; Klemfuss et al., 2016; Stolzenberg & Lyon,

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2014; Szojka, Andrews, Lamb, Stolzenberg, & Lyon, 2017) and the effects of attorney questioning on jurors' perceptions (Klemfuss, Quas, & Lyon, 2014; Mugno, Klemfuss, & Lyon, 2016).

Examinations of transcripts of in-court questioning have revealed that children often provide terse responses to attorney questions (Andrews et al., 2015; Klemfuss et al., 2014; Stolzenberg & Lyon, 2014). Such may not be surprising, given that a majority of attorneys' questions call for single-word or single-phrase responses (e.g. yes/no, Andrews et al., 2015; Klemfuss et al., 2014; Stolzenberg & Lyon, 2014). This means, though, that there is minimal available information to evaluate the credibility of the child's statements, and jurors instead may focus on the content of attorneys' questions to gather evidence about what might have happened. In support of this proposition, Klemfuss et al. (2014) analyzed actual CSA case transcripts and demonstrated that attorneys' questions, but not children's responses, predicted jurors' verdict decisions, suggesting that attorney questioning contributes significantly to jurors' perceptions of these cases. Similarly, Mugno et al. (2016) found that the amount of temporal structure in attorneys' questions (i.e. provision of temporal information that provides cohesion within or across questions) influenced mock jurors' perceptions, regardless of children's responses.

In the present study, we extended this correlational work (Klemfuss et al., 2016; Mugno et al., 2016) by selecting excerpts taken from direct or cross-examination and manipulating the amount of temporal structure in attorneys' questions. We examined how these questioning styles affected mock jurors' perceptions of the child witness, the questioning attorney and verdict decisions. Given that trials take place over several days and sometimes even weeks, we examined whether questioning style affected mock jurors' ability to retain accurate information after a delay. Additionally, because memory for case information can influence the decision-making process

(Pennington & Hastie, 1988), we examined whether the amount of accurate information recalled was related to the perceptions formed about the case.

Examination phase

When attorneys question witnesses on the stand, they are motivated to portray evidence in a way that supports their version of events, which is the foundation of the adversarial system in the United States. As such, attorneys are likely to engage in questioning strategies that are most likely to elicit desired responses from children to thereby communicate their version of events to the jury. In CSA cases, the prosecution attorney will question the child victim/witness during direct examination in a manner that they believe will allow the child to confirm the alleged abuse and convince the jury both that the abuse occurred and that the defendant perpetrated the crime. Prosecutors will likely attempt to elicit a consistent, accurate account from the child witness and, to this end, are more likely to utilize open-ended questions that should enhance children's performance. They also use fewer suggestive and closed-ended questions than defense attorneys (Andrews et al., 2015; Klemfuss et al., 2014; 2016; Stolzenberg & Lyon, 2014; Zajac, Gross, & Hayne, 2003).

On the other hand, the defense attorney's goal is to discredit the child's testimony during cross examination. This is often achieved through the use of suggestive and/or complex questions that attempt to create or identify inconsistencies in the child's responses (Andrews et al., 2015; Klemfuss et al., 2014; Szojka, Andrews, Lamb, Stolzenberg, & Lyon, 2017; Zajac & Cannan, 2009; Zajac & Hayne, 2003, 2006). In fact, questioning strategies during cross-examination of child witnesses have been found to lower the perceived credibility of the child witness and decrease jurors' likelihood of convicting the defendant (Castelli, Goodman, & Ghetty, 2005; Mugno et al., 2016; Tubbs, Wood, & Hosch, 1999).

Evidence suggests that jurors can identify differences in attorney questioning style, or at least recognize differences in attorneys' goals, based on questions asked during direct and cross-examination (Castelli et al., 2005; Mugno et al., 2016; Tubb et al., 1999). Thus, attorney questioning style can be especially influential in cases where minimal evidence exists and attorneys become responsible for helping jurors fill in the gaps. Recently, Klemfuss et al. (2016) have considered another type of questioning strategy pertaining to temporal structure that may also influence jurors' perceptions. This questioning strategy refers to the order in which information is discussed in court. Attorneys can ask questions or present information in a consistent forward temporal order (i.e. high temporal structure), which is typically easier for listeners to follow (Buckner & Fivush, 1998; Fivush, Haden, & Adam, 1995; Kulkofsky & Klemfuss, 2008; Nelson & Fivush, 2004) and has been proposed to lead to decision-making fluency (Pennington & Hastie, 1986, 1988). On the other hand, attorneys can ask questions in a manner that disrupts the temporal order of events (i.e. low temporal structure), which may confuse jurors and introduce reasonable doubt (Pennington & Hastie, 1986, 1988).

Temporal structure

Attorneys may also vary in the amount of temporal structure (i.e. cues to temporal context) they provide in their questions to child witnesses (Klemfuss et al., 2016), and this variation has been shown to influence juror decision-making (Mugno et al., 2016). Pennington and Hastie's (1986, 1988) model of juror decision-making states that jurors make case decisions by first working towards creating a viable story as they listen to evidence. If this process produces one story that appears more plausible than other potential stories, the juror will render a verdict in line with that story (Pennington & Hastie, 1988). Information organized with high temporal

structure (i.e. consistent forward temporal order) should not only help jurors create plausible story lines, which could influence perceptions, it should also help jurors recall more information about the case (Black & Bern, 1981; Thorndyke, 1977; Zacks, Tversky, & Iyer, 2001). High temporal structure should activate a schema alongside the processing of the new information, and, thus, the schema and memory traces are both activated during recall, increasing the availability of information (Pezdek & Roe, 1995).

Klemfuss et al. (2016) examined variations in attorneys' use of temporal structure in transcripts of CSA cases by creating categories of degree of temporal structure based on previous research (e.g. Davies & Seymour, 1998; Kulkofsky & Klemfuss, 2008; Zajac & Hayne, 2003). They found that attorneys provided more temporal structure for child witnesses in direct examination than in cross-examination and that attorneys varied their use of temporal structure in direct examination based on the child witness's age. However, these analyses do not indicate whether jurors can identify or are influenced by attorneys' use of temporal structure specifically, or in combination with examination phase. Mugno et al. (2016) did find correlational evidence of examination phase and temporal structure influencing mock jurors' perceptions. Specifically, participants who read a direct examination excerpt or an excerpt with high temporal structure rated that child witness as more credible and the attorney's performance as more favorable. Participants who read a direct examination excerpt were also more likely to convict. However, because temporal structure was not manipulated, it is not clear which components of this type of questioning style may have influenced the outcomes.

The goal of the current study was to use a novel, experimental design to examine the effects of examination phase and temporal structure on mock jurors' perceptions and decisions in CSA cases. We further extended previous studies by examining the potential

effects of examination phase and temporal structure on mock jurors' memory for case-relevant information after a delay. Mock jurors read a brief trial excerpt of one child witness being questioned during either direct or cross-examination. We manipulated the transcripts so that the questioning attorney utilized high or low temporal structure during questioning. Mock jurors' memory for the transcripts was assessed after a two-day delay. Our outcomes of interest included participants' verdict decisions, ratings of the child's credibility and the attorney's performance, and the proportion of accurate information recalled about the case.

Hypotheses

Given that the goal of direct examination of a child victim/witness in a CSA case is to allow the child to credibly report alleged abuse (Andrews et al., 2015; Klemfuss et al., 2014, 2016; Zajac et al., 2003), and in line with Mugno et al. (2016), we expected that reading direct examination would result in enhanced perceptions of the child witness and questioning attorney, in addition to higher conviction rates.

Because the presence of temporal structure is expected to help jurors create a story that will influence their perceptions of the case (Pennington & Hastie, 1986, 1988, 1991). We expected that excerpts with high temporal structure would result in participants reporting higher child credibility ratings and higher attorney performance ratings, when compared with excerpts with low temporal structure. Although Mugno et al. (2016) did not find an effect of temporal structure on verdict decisions, we expected a stronger effect of temporal structure in this study due to the experimental manipulation, and expected more guilty verdicts after participants read a high temporal structure excerpt.

In terms of memory outcomes, because direct examination and high temporal structure are intended to provide jurors with a credible and cohesive story of the alleged abuse

incident, we expected that this type of questioning style would result in more accurate memory reports. Finally, we explored whether perceptions of the child witness and questioning attorney were associated with memory accuracy, given that previous work suggests that memory reports are related to perceptions of the case (Costabile & Klein, 2005; Greene, 1981; Ruva & Guenther, 2015; Ruva & McEvoy, 2008; Ruva, McEvoy, & Bryant, 2007). Specifically, a possible mechanism behind the increase in enhanced perceptions after reading a direct examination transcript with high temporal structure may be due to participants being able to retain more accurate information.

Method

Participants

Undergraduates at a Southern California university signed up to participate for the two-day study via the university's online subject pool for extra credit in a psychology course. The full sample consisted of 175 undergraduates (78.3% female, 21.1% male) ranging in age from 18 to 34 years old ($M = 21.19$, $SD = 2.86$). The ethnic distribution of the sample was 35.8% Hispanic/Latino, 30.3% Asian, 14.3% Caucasian, 2.9% African American and 16% who identified as mixed/other. Participants were excluded from the final sample if they did not return for the second visit ($n = 14$), did not answer all four attention checks correctly ($n = 11$) or did not provide a response when asked for consent to participate ($n = 2$). Additionally, participants were required to meet the eligibility requirements to serve on a jury in the state of California, which include being at least 18 years old, fluent in English and a U.S. citizen, and having no prior felony convictions. Participants who did not meet these requirements were also excluded ($n = 6$), resulting in a final sample of 142 participants, well above the sample size of 128 as recommended by G-power analysis to detect

any main effects or interactions in the current design.

Materials

Participants were randomly assigned to an excerpt in a 2 (examination phase: direct, cross) \times 2 (temporal structure: high, low) between-subjects design. Two excerpts were used to fill each cell to control for variations between cases such as evidence strength and type of sexual abuse described. Transcripts were originally selected from actual criminal cases of CSA that occurred in Los Angeles County between 1997 and 2001 and were modified for use in a previous study (Mugno et al., 2016). Of this subset of 16 transcript excerpts, we first selected two direct examination excerpts and two cross-examination excerpts from separate cases that met our matching criteria. Because these cases involved examination of an alleged child victim, the direct examination was always conducted by a prosecuting attorney, and cross-examination was always conducted by a defense attorney. The selected excerpts were matched across examination phase, included only female victim/witnesses and were matched on age ($M = 12$, $SD = 0.82$). After matching transcripts on actual case outcome (conviction, acquittal) and victim/witness details, we matched the transcripts on severity of the abuse allegations described as closely as possible. In the selected transcripts, both direct and cross-examination conditions included a transcript that each described either one or two abuse allegations, in which the latter was considered to describe more severe allegations, but without genital penetration. The direct examination excerpt described fondling under clothing (one event) or kissing and fondling over clothing using force (two events). The cross-examination excerpt either described kissing and fondling over clothing (one event) or kissing and genital-genital contact between the perpetrator and the victim (two events).

Transcript excerpt modification

The excerpts were reduced so that, in every excerpt, there was an equal number of attorney-child conversational turns (i.e. 19), all describing a single allegation of CSA. Attorneys' questions were matched, such that each transcript consisted of a greater number of closed-ended questions than open-ended questions. Although previous analyses have revealed that prosecution attorneys use more open-ended questions than defense attorneys (Andrews et al., 2015; Klemfuss et al., 2014; Stolzenberg & Lyon, 2014; Zajac et al., 2003), both attorneys use a greater number of closed-ended questions than other types of questions (Andrews et al., 2015; Klemfuss et al., 2014; Stolzenberg & Lyon, 2014). The excerpts were modified to include 12 closed-ended questions (e.g. 'Was that over or under your clothing?') and seven open-ended questions (e.g. 'And what happened?') to avoid obvious differences between direct and cross examination based on the use of attorney questioning strategies. The child's responses were modified to be minimal to help ensure that any differences in the outcome variables would result from the attorney's questioning style. Specifically, children's responses were abbreviated, as needed, to provide only the minimal amount of information required to answer the attorney's question (e.g. yes/no). Each transcript included only two responses in which the child elaborated on their minimal response (e.g. 'Yes, I said *don't touch me*').

Temporal structure. A high and low temporal structure version of each of the four selected excerpts was created to produce a total of eight excerpts to fit the 2×2 design. The definitions of high and low temporal structure were based on those used in previous, related research (Klemfuss et al., 2016; Mugno et al., 2016).

High temporal structure. In the high temporal structure versions of the excerpts, eight attorney questions were modified to include a sequencing term at the beginning or end of the

question such as 'After that, did you go into the shed?' or 'What happened next?' Eight additional questions were modified to help the child locate the event in a general timeline, such as 'When that was happening, where was your brother?' The remaining two questions were modified to maintain the conversational topic from the previous attorney/child interaction without adding to, or detracting from, the temporal sequence.

Low temporal structure. In the low temporal structure versions of the excerpts, 13 questions were modified so that the attorney apparently changed the topic of conversation between conversational turns. Changing conversational topics included asking about something else other than the alleged abuse event, or asking about the child witness's history with the alleged abuser. The remaining five questions were manipulated to maintain the conversational topic without affecting temporal sequence. For all of the high and low temporal structure excerpts, the question types were intermixed throughout the excerpt.

After modifying the excerpts, each attorney question was coded for temporal structure and as either open or closed ended. Children's responses were coded to confirm that they contained primarily the most minimal response required to answer the question, and that there were equal numbers of responses that were minimal, and elaborated, across all transcript excerpts. Inter-rater reliability was established by two independent coders, one of which was the first author who conducted the transcript modifications based on prior research (Klemfuss et al., 2016; Mugno et al., 2016) and trained a second coder who was blind to study hypotheses. Both coders independently coded all excerpts on attorney temporal structure ($K = .80$), open- and closed-ended questions, ($K = .92$) and children's responses ($K = .85$). Any disagreements were discussed, and consensus codes were used in the final dataset. The total word count in each excerpt, assessed separately for attorneys'

questions and children's responses, was tabulated using Microsoft Word. Excerpt word average was matched across temporal structure (high: $M = 253.75$, $SD = 8.26$; low: $M = 218.50$, $SD = 13.87$) and examination phase (direct: $M = 235.75$, $SD = 22.75$; cross: $M = 236.50$, $SD = 23.90$). An example of a high and low temporal transcript during direct examination is provided in the Appendix.

Procedure

Visit 1

Participants reported to a small computer lab in groups ranging from two to eight and were greeted by a trained research assistant. Each participant was assigned a participant identifier for the sole purpose of tracking their responses across both days but were assured that their responses would not be linked to their names once they completed the study. A sheet with the participant's name and identifier was kept in a locked file cabinet and was destroyed upon the participant's completion of the second visit to ensure that participants' responses would remain anonymous. Participants were seated at a computer station where they completed the study via the online survey platform, Qualtrics (www.qualtrics.com). Once seated at a computer station, participants read the informed consent, and, upon agreeing to participate in the study, they were asked to enter their participant identifier in a text box on the screen. Participants were then presented with the following instructions:

You are about to read an excerpt from an actual case of possible child sexual abuse. A child is being questioned by an attorney. Child sexual abuse charges can include requests for sexual activities (regardless of outcome), indecent exposure, physical sexual contact, or production of pornography with a child below the age of 18. Please read the court excerpt carefully. After reading the excerpt, we will ask you a series of questions about your perceptions and opinions regarding the excerpt and the case.

Participants were then randomly assigned to read one of the eight trial excerpts that varied in examination phase (direct, cross) and temporal structure (high, low). Next, participants were asked whether they would vote guilty if they were a juror on the case (yes/no) and were asked to provide an open-ended explanation for their verdict decision. The qualitative explanations provided were typically one-sentence phrases describing a single explanation such as 'I think the child was a credible witness'. A systematic analysis was conducted by first taking an overview of the data and creating a list of potential themes that were then reduced into 12 possible categories. Two coders, who were blind to study hypotheses, coded the responses into one of the possible theme categories. Coders independently scored approximately 20% of the responses and discussed any disagreements before final codes were agreed upon ($K = .97$). The remaining responses were split between coders, and codes were assigned independently. Because the majority of participants (88%) reported only one reason for their verdict decision, only the first code is further reported. The categories included:

1. *Presumption*: The abuse must have occurred because it was alleged (e.g. 'The child said he/she was touched inappropriately').
2. *Child testimony*: The child's testimony was convincing (e.g. 'The testimony seemed valid').
3. *Child credibility*: The nature in which the child testified was believable/not believable (e.g. 'The child was certain about the details', or 'The child was very inconsistent').
4. *Child honesty*: Referring to the child's honesty/dishonesty (e.g. 'Because a child would not lie about something like that').
5. *Faulty logic*: Making an inference that is unrelated to the crime, the evidence, or how legal decisions are

made (e.g. 'Because the statistics of sexual assaults on children are high and continue to increase').

6. *Logical inference*: Making an inference that is related to the crime, the evidence, or how legal decisions are made, regardless of accuracy (e.g. 'There would be marks on the child's fingers, proving the defendant was abusing the child').
7. *Overall credibility*: The case in general seemed credible/not credible (e.g. 'There was convincing evidence').
8. *Internal state*: Based on the thoughts, feelings or opinions demonstrated by the child or the defendant (e.g. 'The defendant did not appear to be remorseful').
9. *Eyewitness*: Someone else was present or saw the crime occurring (e.g. 'He was seen touching the child').
10. *Lack of evidence*: There was insufficient evidence to warrant conviction (e.g. 'I would need to see additional evidence').
11. *Attorney credibility*: The nature in which the attorney questioned the child was problematic (e.g. 'The attorney was asking misleading questions').
12. *Other*: Any reason outside of the aforementioned categories.

Participants were then asked a series of questions about the child witness's credibility ($n = 22$), which included items such as 'How intelligent do you think the child is?' and 'How reliable is the child's memory?' All child credibility items were on the same 6-point scale and demonstrated high inter-item reliability ($\alpha = .94$). Thus, participants' responses to these items were averaged to create a child credibility composite, with higher numbers indicating a more credible witness ($M = 4.01$, $SD = 0.87$).

The attorney's performance was evaluated with eight items such as 'How well do you

think the attorney performed in questioning the child' and 'How much experience do you think the attorney has questioning children?' These questions were also on a 6-point scale and demonstrated high inter-item reliability ($\alpha = .75$). Thus, participants' responses to these items were averaged to create an attorney performance composite, with higher numbers indicating a more favorable performance ($M = 3.69$, $SD = 0.89$). Finally, participants were asked demographic questions.

After completion of the questionnaire, participants were reminded to return to the same room at the same time two days later for the second part of the study. Participants were not aware their memory for the excerpt would be tested.

Visit 2

Upon participants' return two days later, they received their participant identifiers and followed procedures similar to those of Visit 1. They were seated at a computer station and were asked to enter their identifiers into a text box. Participants were then provided with a prompt informing them that they would be asked about the trial excerpt that they read on their first visit. Participants were asked to answer each question as completely as possible, despite some questions appearing similar to others. Participants completed the entire memory questionnaire via Qualtrics, an online survey platform.

Free recall. Participants were provided with two free recall questions about the content of the excerpt. The first free recall prompt asked participants to recall as much as possible about the excerpt they had read two days prior. The second free recall prompt asked participants to recall and report what the allegation of abuse specifically entailed. Participants entered their response into a text box, and responses were later coded for the number of accurate and inaccurate statements reported. Two independent coders scored all responses and

discussed any disagreements before final codes were agreed upon ($K = 1.00$). Statements that were not verifiable as accurate or inaccurate (e.g. subject statements 'I think the child was telling the truth') occurred infrequently for each question (18–45%) and were not further analyzed in the interest of focusing on memory accuracy.

Prompted recall. The prompted recall questions asked for additional details about the alleged abuse and information about the child's behavioral, verbal and emotional reactions during the testimony and at the time of the abuse. The questions were coded for accuracy, such that we categorized whether each detail reported was included in the excerpt and was correctly recalled or the participant correctly recalled that it was not included in the excerpt. Details that were included in participants' responses but were not included in the excerpt were coded as incorrect responses. We also coded for 'I don't know/remember' responses, general references to the transcript (e.g. 'the transcript said so') or general knowledge or inferences about child sexual abuse (e.g. 'If I was abused, I would be scared to testify'). Subjective statements occurred infrequently for each question (0–24%) and were not further analyzed in the interest of focusing on memory accuracy. For these recall questions, two independent coders who were blind to study hypotheses scored approximately 20% of the responses and discussed any disagreements before final codes were agreed upon ($K = .96$). The remaining responses were split between coders, and scores were assigned independently.

After coding all memory responses, we examined accuracy across all question types using a proportion score created by dividing the total number of accurate details by the total number of accurate and inaccurate details reported by each participant. Upon completion of the memory questionnaire, participants were debriefed and thanked for their time.

Results

Analysis plan

We first present preliminary analyses to identify any potential confounds due to participant gender. For our primary analyses, we examined whether our main variables of interest (examination phase, temporal structure) influenced whether participants would vote guilty if they were a juror on the case (hereafter referred to as verdict decision), child credibility and attorney performance ratings, and the accuracy of their memory reports. We first present findings of a binary logistic regression predicting verdict decisions based on examination phase and temporal structure. Next, we provide descriptive statistics for participants' qualitative reasons behind their verdict decisions to better understand how participants justified their verdict decision, given that participants were provided with minimal evidence. Then we tested the effects of examination phase and temporal structure on child credibility ratings and attorney performance ratings using two analyses of variance (ANOVAs). We also report findings of an two ANOVA comparing memory accuracy by examination phase and temporal structure. Finally, we report correlations between memory accuracy and child credibility ratings and attorney performance ratings.

Preliminary analyses

To examine whether participants were equally distributed across examination phase and temporal structure conditions, we conducted two chi-square tests of independence, which revealed that participant gender was equally distributed across examination phase, $\chi^2(1) = 1.197, p = .274$, but more males were randomly assigned to the high temporal structure condition ($n = 19$) than to the low temporal structure condition ($n = 9$), $\chi^2(1) = 5.182, p = .023$. However, another chi-square test revealed that gender was equally distributed across all eight possible transcript excerpts, $\chi^2(7) = 9.328, p = .230$. Contrary to previous

findings (Bottoms et al., 2007), further analyses revealed there were no gender differences in the likelihood that participants would vote the defendant guilty, $\chi^2(1) = 1.288, p = .257$, in child credibility ratings, $t(140) = -0.628, p = .531$, or attorney performance ratings, $t(140) = 0.142, p = .887$, and did not significantly impact results when included as a control variable in the primary analyses, thus participant gender was not considered further.

Trial variables

We conducted a binary logistic regression to examine whether examination phase and temporal structure predicted whether participants indicated that they would vote the defendant guilty if they were a juror on the case (0 = not guilty, 1 = guilty). The model was significant, $\chi^2(2, N = 142) = 8.58, p = .014$, and correctly classified 76.1% of the cases (Nagelkerke $R^2 = .09$). Jurors were more likely to vote guilty when they read a direct examination excerpt (86.8%) than when they read a cross-examination excerpt (66.2%, $\text{Wald } \chi^2 = 7.51, \beta = 1.20, p = .006$). The model did not reveal a significant main effect for temporal structure ($\text{Wald } \chi^2 = 0.07, \beta = -0.11, p = .792$), but revealed a marginal interaction between examination phase and temporal structure ($\text{Wald } \chi^2 = 2.79, \beta = -1.51, p = .095$). Because the interaction trended towards significance, we explored this relationship in separate analyses. A chi square test of independence revealed that the effect of examination phase is only predictive of participants' verdict decision when the temporal structure is low, $\chi^2(1) = 9.901, p = .002$. Specifically, when participants read a direct examination excerpt with low temporal structure, 92.3% of participants voted guilty, compared to 61.8% of those who read a cross examination excerpt with low temporal structure. On the other hand, the conviction rate was quite similar across excerpts with high temporal structure, $\chi^2(1) = 0.756, p = .385$ (direct = 79.3%, vs. cross = 70.0%).

Participants were asked to provide qualitative explanations for why they felt they would

Table 1. Participants' qualitative explanations for verdict decisions.

Category		Verdict decision			
		Guilty(<i>n</i> = 108)		Not guilty(<i>n</i> = 34)	
		%	<i>n</i>	%	<i>n</i>
1	Presumption	51.9	56		
2	Child testimony	2.8	3		
3	Child credibility	14.8	16	29.4	10
4	Child honesty	2.8	3		
5	Faulty logic	4.6	5		
6	Logical inference	11.1	12		
7	Overall credibility	1.9	2		
8	Internal state	2.8	3		
9	Eyewitness	1.9	2		
10	Lack of evidence			50.0	17
11	Attorney credibility			17.6	6
12	Other	5.6	6		
	No response			2.9	1

Note: *N* = 142.

vote guilty or not guilty if they were a juror on the case. As illustrated in Table 1, of participants who voted guilty, the most common explanation was the presumption that the child's statements were true (51.9%, *n* = 56), followed by finding the child witness credible (14.8%, *n* = 16), or by making a logical inference about the case or about sexual abuse that led them to vote guilty (11.1%, *n* = 12). Participants who voted not guilty most commonly reported doing so because there was not enough evidence to convict (50%, *n* = 17), followed by skepticism about the credibility of the child (29.4%, *n* = 10) or the attorney (17.6%, *n* = 6).

Child witness credibility and attorney performance

To examine whether examination phase and temporal structure influenced mock jurors' perceptions of the child witness and the attorney's performance, two separate ANOVAs were conducted. These analyses examined the main effects of examination phase and temporal structure, and their interactions, on child

credibility ratings and attorney performance ratings. The first model revealed a significant main effect of examination phase on child credibility ratings, $F(1, 138) = 7.32, p = .008$, partial $\eta^2 = .05$. Participants who read a direct examination excerpt rated the child witness as more credible ($M = 4.21, SD = 0.72$) than did those who read a cross-examination excerpt ($M = 3.82, SD = 0.96$). Temporal structure did not have a significant main effect, $F(1, 138) = 0.14, p = .714$, nor was there a significant interaction between examination phase and temporal structure, $F(1, 138) = 1.11, p = .294$, on child credibility ratings.

The second model revealed a marginal effect of examination phase on attorney performance ratings, $F(1, 138) = 3.59, p = .060$, partial $\eta^2 = .03$. Participants who read a direct examination excerpt rated the attorneys' performance as slightly more favorable ($M = 3.84, SD = 0.86$) than did those who read a cross-examination excerpt ($M = 3.54, SD = 0.90$). Temporal structure did not have a significant effect on attorney performance ratings, $F(1, 138) = 0.82, p = .37$, nor did the interaction between examination phase and

temporal structure, $F(1, 138) = 0.31, p = .576$.

Memory accuracy

To examine whether examination phase and temporal structure influenced the amount of information that participants recalled, a one-way ANOVA with examination phase and temporal structure as the independent variables and memory accuracy as the dependent variable was conducted. The ANOVA revealed a significant main effect of examination phase, $F(1, 111) = 9.88, p = .002$, partial $\eta^2 = .082$. Participants who read a direct examination phase excerpt recalled a higher proportion of accurate case details ($M = .99, SD = .05$) than did those who read a cross-examination excerpt ($M = .93, SD = .10$). The ANOVA also revealed a significant effect of temporal structure on memory accuracy, $F(1, 111) = 3.98, p = .049$, partial $\eta^2 = .035$. Contrary to our hypothesis, participants who read an excerpt with low temporal structure remembered slightly more information ($M = .98, SD = .06$) than those who read an excerpt with high temporal structure ($M = .94, SD = .10$). There was not a significant interaction between examination phase and temporal structure, $F(1, 111) = 0.861, p = .355$.

Finally, we examined whether memory accuracy was related to perceptions of the child witness and the questioning attorney. Two bivariate correlations revealed that memory accuracy was not related to child credibility ratings ($r = .079, p = .40$), nor to attorney performance ratings ($r = .065, p = .49$).

Discussion

The present study examined whether attorney questioning style in CSA cases can influence mock jurors' perceptions of the case and their recall of children's testimony in a two-part study. In terms of the effects of examination phase on mock juror perceptions, results partially replicated previous findings (Mugno et al., 2016). Participants who read direct

examination perceived the child witness as more credible, and they were more likely to vote guilty. However, an interaction revealed that examination phase was only predictive of verdicts in low temporal structure conditions, contrary to previous correlational findings. In terms of memory for case details, this study was the first to reveal that direct examination style questioning helps mock jurors report more accurate case information. Unexpectedly, participants accurately recalled a higher proportion of accurate details from the excerpts with *less* temporal structure.

Examination phase

Mock jurors responded differently when presented with direct versus cross-examination excerpts, despite not being told which trial phase they were reading. Although in the present study, transcripts were matched across examination phase on elements that typically vary, such as word count and question types (e.g. open/closed-ended), there were evidently still sufficient differences in attorney questioning style to significantly impact our participants' perceptions and decisions.

The questioning style used by attorneys in direct examination resulted in higher child credibility ratings and more favorable verdicts for the prosecution. Extending previous findings (Klemfuss et al., 2014; Mugno et al., 2016), the current study demonstrated that mock jurors may be looking towards attorneys to guide their credibility assessments. In our trial excerpts, children's responses were minimal and consistent across transcripts, suggesting that attorney questioning style is likely what influenced participants' perceptions of the child witness's credibility. This is an alarming finding because it suggests that participants are not making accurate credibility assessments of the child witness if they are basing their perceptions of the child witness on the attorney's questions. As such, a child's perceived credibility appears to be at least partially dependent on the behavior of attorneys,

regardless of how it affects children's responding.

Also, in line with the goal of direct examination, participants who read a direct examination excerpt were more likely to vote to convict the alleged perpetrator than participants who read a cross-examination excerpt. Although in actual cases, jurors would be presented with full arguments and evidence from both the prosecution and defense, it is important to understand how each examination phase influences jurors. Specifically, a strong argument made in one examination phase can shift jurors' decision-making process for the rest of the trial to reach a desired conclusion (Simon, 2004). In the current study, almost all participants who read a direct examination excerpt voted to convict (86.8%), despite the fact that participants were only presented with one brief excerpt of one examination phase without additional evidence and thus should have had insufficient evidence to convict. This bias towards conviction was also demonstrated by the qualitative explanations that participants reported for their verdict decisions. Participants most often reported voting guilty because they implicitly believed the child's allegation or believed the child was a credible witness. It is fairly surprising that almost two thirds of participants that voted guilty referenced qualities of the child witness driving their decision despite hearing very minimal testimony from the child witness and only reading a brief excerpt of one examination phase. The qualitative responses suggest that participants are not aware that they are being influenced by extra-legal factors such as the types of questions attorneys ask.

Temporal structure

The manipulation of temporal structure in our study did not replicate the effects of naturally occurring variations in temporal structure found in Mugno et al. (2016). However, an interaction trending towards significance revealed that the effects of examination phase on verdict decisions were strongest in the low

temporal structure condition. Thus, the low temporal structure excerpts may have highlighted the differences in questioning style between the prosecution and defense attorneys, while high temporal structure masked them.

The effects of temporal structure in this study may have been different for a few reasons. In an attempt to isolate the effects of temporal structure when creating a story, we manipulated the high temporal structure excerpt to include temporal terms in almost all questions, and the questions were asked in forward temporal order. On the other hand, the low temporal structure excerpt included frequent switching between conversational topics, causing disruption in the temporal order. Although we included five questions in the low temporal structure condition that maintained the topic of conversation in an attempt to avoid artificiality, this may have reduced the strength of our manipulation. Thus, our manipulations may have appeared too artificial and unrealistic to participants, thereby reducing any potential benefits of naturally occurring temporal structure in attorneys' questions, or were not strong enough to clearly indicate the temporal structure found in Mugno et al. (2016).

Another potential explanation is that attorneys' use of temporal structure in the original excerpts may have occurred in conjunction with other variations in questioning style. Perhaps attorneys who were more experienced with questioning children, or who were particularly concerned with enhancing children's testimony, used more temporal markers and less topic switching in conjunction with other developmentally appropriate questioning practices. There is peripheral evidence to suggest that the latter may be true. Specifically, prosecutors, whose job it is to maximize child victim/witness credibility in CSA cases, tend to naturally use more temporal structure during questioning (Klemfuss et al., 2016), and also tend to ask more open-ended questions and fewer suggestive questions, than do defense attorneys (Klemfuss et al., 2014). Although

the use of open-ended and suggestive questions was matched across transcripts, it is possible that some other question characteristics tend to vary with temporal structure when attorneys take a developmentally sensitive approach to questioning children.

Memory

This study was the first to demonstrate that direct examination style questioning can increase the amount of accurate case information that mock jurors recall about a CSA allegation. This finding suggests that the type of questioning typically included in direct examination may be helping participants retain more accurate information. Additionally, an attorney asking a seemingly credible child witness about the event could elicit sadness in participants, which has been associated with more accurate memory reports because it increases attention to detail (Lerner, Li, Valdesolo, & Kassam, 2015). However, no research to date has measured the emotions elicited in jurors in CSA cases and the potential effects on decision-making in this context.

In terms of the effects of temporal structure on memory reports, the results contradicted our hypotheses. Participants remembered a slightly higher proportion of accurate information after reading an excerpt with low temporal structure than those who read an excerpt with high temporal structure. Because our manipulation of temporal structure was perhaps too artificial, the frequent topic switching in the attorney's questions may have prompted increased attention from the participant. However, it is too early to extrapolate from these findings, and further research is recommended.

We also did not find a relationship between perceptions of the child witness and the questioning attorney and memory for case details. Although previous mock trial studies have found that jurors tend to remember information in a biased manner (Costabile & Klein, 2005; Greene, 1981; Ruva & Guenther, 2015;

Ruva & McEvoy, 2008; Ruva et al., 2007), it is important to examine how accurate memory reports are related to case perceptions. Our coding scheme did not capture bias in the memory reports but instead took a more thorough approach by examining total accuracy, rather than coding for information that supports one verdict versus another. Similar lines of work that have examined total recall accuracy have done so by analyzing accurate and inaccurate details separately (Hope, Eales, & Mirashi, 2014); we instead examined total amount of accurate information and accounted for any inaccurate information provided (i.e. proportions). As such, post hoc exploratory analyses revealed that the number of correct details reported was positively correlated with child credibility ratings ($r = .188$, $p = .025$), suggesting that this more stringent approach reduced the relationship between memory accuracy and perceptions of the child witness.

Limitations and future directions

Future research should extend the present findings to further inform our understanding of how attorneys can influence how jurors form opinions of child witnesses, the questioning attorneys and the type of information recalled about the case. First and foremost, we may have created excerpts that were too brief or too artificial compared to the naturally occurring temporal structure in the original transcripts. In comparison to the excerpts used in Mugno et al. (2016), our excerpts were markedly shorter in word count (i.e. average word count was 310.44 across temporal structure in the original study versus 236.13 in the current study). These brief excerpts may not have been sufficient to create the desirable amount of temporal structure. However, the goal of the current study was to examine temporal structure in a controlled setting, and our null findings suggest that further examination is needed. Perhaps manipulating temporal

structure across the entire examination phase would be more effective to capture the benefits of temporal structure. Additionally, because we opted to maintain original components of the transcript such as the type of abuse described and keep as much of the attorney's original questions as possible, we can still generalize our findings to actual cases. Although the abuse allegations between conditions were slightly different, we did not find that it impacted the results, as the most severe abuse allegation described (genital-genital contact) was in the cross-examination condition, which in fact resulted in lower conviction rates. Future studies can increase internal validity and control for these differences by, for example, selecting one transcript and manipulating it to reflect the desired questioning structure.

Manipulating temporal structure in a greater number of excerpts can also ensure that the individual variability in one excerpt is not influencing outcomes. Due to the significant amount of effort placed on matching transcripts as closely as possible, only four transcript excerpts were manipulated into a high and low temporal version of each. However, manipulating additional transcripts would help establish a stable mean across conditions to truly see the effect.

Additionally, this effect may be more apparent when applied to an entire examination phase, and thus we should manipulate temporal structure during an entire examination phase and then provide both examination phases of the same witness to participants. This will also help us understand how the presence of an opposing story in the competing examination phase will influence jurors' decisions. By manipulating whether the competing examination phase attempts to provide an alternative story of what occurred versus only disrupting the structure, we can better understand whether a competing story strengthens or weakens confidence in jurors' verdict decisions.

Conclusions

The current study demonstrated that attorneys' questioning tactics can influence jurors' credibility ratings of the child witness, despite minimal responding, which ultimately influence case outcomes and the type of information recalled about the case. Specifically, mock jurors who read a direct examination excerpt perceived the child witness as more credible, were more likely to convict the defendant and remembered a higher proportion of accurate information than did jurors who read an excerpt from cross examination. However, we did find that the effects of examination phase on verdict decisions were most prominent in transcripts with low temporal structure. Finally, mock jurors who voted to convict the defendant most commonly reported being influenced by a credible child witness, despite reading minimal testimony. These findings suggest that in actual cases, attorney questioning style may play a significant role in influencing jurors' perceived credibility of the child witness directly, rather than indirectly, through influencing children's responses. As such, we should be paying closer attention to understanding the effects of different types of questions that are allowed when questioning young children in court. And, if they induce undue prejudice, we may need to consider additional regulations on the types of questions that are allowable for vulnerable witnesses.

Ethical standards

Declaration of conflicts of interest

Alma P. Olaguez has declared no conflicts of interest

Jessica Zoe Klemfuss has declared no conflicts of interest

Ethical approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee at the University of

California, Irvine and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent

Informed consent was obtained from all individual participants included in the study

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Appendix

Example of trial excerpt (direct examination)

Low temporal structure

ATTORNEY: WHAT WAS YOUR REACTION TO HIS KISS?

CHILD: I STOOD UP.

ATTORNEY: AND WHAT DID HE DO?

CHILD: HE STARTED TOUCHING ME.

ATTORNEY: DID HE EVER TOUCH YOU ANOTHER TIME?

CHILD: YES.

ATTORNEY: HOW DID HE START TOUCHING YOU THE FIRST TIME? WHAT PART OF YOUR BODY WAS HE TOUCHING?

CHILD: MY BEHIND AND MY, MY PRIVATE.

ATTORNEY: WAS THE TOUCHING THE SECOND TIME LIKE THE FIRST?

CHILD: YES.

ATTORNEY: YOU SAID YOU TRIED TO PUSH HIM AWAY. WERE YOU ABLE TO PUSH HIM AWAY?

CHILD: NO.

ATTORNEY: DID YOU PUSH HIM AWAY THE SECOND TIME?

CHILD: HE TRIED TO PULL ME CLOSER TO HIM.

ATTORNEY: OKAY. AND WHAT HAPPENED?

CHILD: HE COULDN'T TOUCH ME, BECAUSE MY BROTHER WAS COMING.

ATTORNEY: WAS THE TOUCHING THE SECOND TIME ON YOUR PRIVATE AND BEHIND?

CHILD: YES.

ATTORNEY: NOW, WHAT PART OF HIS BODY WAS HE TOUCHING YOUR PRIVATE WITH THE FIRST TIME?

CHILD: HIS HAND.

ATTORNEY: DID HE USE HIS HAND TO TOUCH YOUR PRIVATE THE SECOND TIME?

CHILD: YES.

ATTORNEY: HOW WAS HE TOUCHING YOUR BOTTOM THE FIRST TIME?

CHILD: HE WAS JUST SQUISHING IT.

ATTORNEY: WAS THE TOUCHING OVER YOUR CLOTHING?

CHILD: YES.

ATTORNEY: WAS HE SQUISHING YOUR BOTTOM THE SECOND TIME?

CHILD: YES.

ATTORNEY: OKAY. HOW DID HE TOUCH YOUR PRIVATE THE FIRST TIME?

CHILD: HE WAS JUST GOING LIKE THIS (INDICATES RUBBING).

ATTORNEY: DID HE DO THAT THE SECOND TIME?

CHILD: YEAH.

ATTORNEY: AND IT STOPPED THE FIRST TIME WHEN YOUR BROTHER WAS COMING?

CHILD: YES.

ATTORNEY: DID IT STOP THE SAME WAY THE SECOND TIME?

CHILD: YES.

ATTORNEY: AND WERE YOU SCARED?

CHILD: YES.

High temporal structure

ATTORNEY: WHAT WAS YOUR REACTION WHEN HE KISSED YOU?

CHILD: I STOOD UP.

ATTORNEY: AND WHAT DID HE DO NEXT?

CHILD: HE STARTED TOUCHING ME.

ATTORNEY: HOW DID HE START TOUCHING YOU? WHAT PART OF YOUR BODY WAS HE TOUCHING?

CHILD: MY BEHIND AND MY, MY PRIVATE.

ATTORNEY: YOU SAID NEXT YOU TRIED TO PUSH HIM AWAY?

CHILD: YES.

ATTORNEY: WERE YOU ABLE TO PUSH HIM AWAY AFTER HE TOUCHED YOU?

CHILD: NO.

ATTORNEY: DID HE GRAB YOU AFTER THAT?

CHILD: HE TRIED TO PULL ME CLOSER TO HIM.

ATTORNEY: OKAY. AND WHAT HAPPENED NEXT?

CHILD: HE COULDN'T TOUCH ME, BECAUSE MY BROTHER WAS COMING.

ATTORNEY: BEFORE HE STOPPED, WAS THE TOUCHING YOU DESCRIBED ON YOUR PRIVATE AND BEHIND?

CHILD: YES.

ATTORNEY: NOW, WHEN HE WAS TOUCHING YOU, WHAT PART OF HIS BODY WAS HE TOUCHING YOUR PRIVATE WITH?

CHILD: HIS HAND.

ATTORNEY: DID HE ALSO USE HIS HAND TO TOUCH YOUR BOTTOM AFTER THAT?

CHILD: YES.

ATTORNEY: WHEN HE WAS USING HIS HANDS, HOW WAS HE TOUCHING YOUR BOTTOM?

CHILD: HE WAS JUST SQUISHING IT.

ATTORNEY: WHEN THE TOUCHING HAPPENED, WERE YOU WEARING CLOTHES JUST AS YOU ARE TODAY?

CHILD: YES.

ATTORNEY: WHEN THIS WAS HAPPENING, WAS THE TOUCHING OVER YOUR CLOTHING?

CHILD: YES.

ATTORNEY: OKAY. WHEN HE TOUCHED YOU WITH HIS HANDS, HOW DID HE TOUCH YOUR PRIVATE?

CHILD: HE WAS JUST GOING LIKE THIS. (INDICATES RUBBING)

ATTORNEY: WHEN HE DID THIS, HE WAS RUBBING WITH HIS HAND?

CHILD: YEAH.

ATTORNEY: AND IT STOPPED AFTER HE HEARD YOUR BROTHER WAS COMING?

CHILD: YES.

ATTORNEY: AND WERE YOU
SCARED WHEN THIS HAPPENED?

CHILD: YES.

ATTORNEY: DID HE TOUCH
YOU LIKE THIS AGAIN?

CHILD: YES.

ATTORNEY: WHEN HE
TOUCHED YOU AGAIN, WAS IT
SIMILAR TO THIS TIME?

CHILD: YES.